Guneet Singh Dhillon

Curriculum Vitae

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guneet-dhillon.github.io

Education

Oct 2021 - Current **University of Oxford**, Oxford, UK
D.Phil. in Statistics
- **Advisors** : Prof. Arnaud Doucet, Prof. Yee Whye Teh, Prof. George Deligiannidis, Dr. Tom Rainforth
- **Funding** : Clarendon Fund Scholarship, University of Oxford (only 1 awardee from the Department of Statistics)
- **College** : St. John's College

Aug 2014 - May 2018 **University of Texas at Austin**, Austin, Texas, USA
B.Sc. in Computer Science with Honors - Turing Scholars Honors
B.Sc. in Mathematics with Honors **GPA: 3.89 / 4.00**
- **Undergrad Honors Thesis** : Training Ising Models on Images using Sparsitron (Advisor - Dr. Adam Klivans)
- **Certificate** : Applied Statistical Modeling
- **Minor** : Economics
- **Research Programs** : Freshman Research Initiative, College of Natural Sciences Directed Reading Program, Department of Mathematics

Work Experience

Jul 2018 - Sep 2021 **Applied Scientist II** (Dec 2019 - Sep 2021)
Applied Scientist I (Jul 2018 - Dec 2019), *Amazon Web Services, Inc.*, Pasadena, CA, USA
- Developed the algorithm *Uniform Sampling over Episode Difficulty* for few-shot image classification with Dr. Stefano Soatto (NeurIPS 2021 spotlight publication)
- Developed the algorithm *Transductive Fine-tuning* for few-shot image classification with Dr. Stefano Soatto (ICLR 2020 publication)
- Devised algorithms for the *Amazon Rekognition Custom Labels* product [link]
- Devised algorithms for the *Amazon Textract* product [link] (U.S. patent)
- Won prizes for constructing innovative solutions for other products via hackathons

May 2017 - Aug 2017 **Software Development Engineer Intern**, *Amazon Web Services, Inc.*, Palo Alto, CA, USA
- Developed the algorithm *Stochastic Activation Pruning* for robust image classification with Dr. Anima Anandkumar (ICLR 2018 publication)

May 2016 - Aug 2016 **Machine Learning Intern**, *CognitiveScale Inc.*, Austin, TX, USA
- Built a search and recommendation system using probabilistic nonnegative matrix factorization and Gibbs sampling techniques, with Dr. Ayan Acharya

Jan 2016 - May 2016 **Undergraduate Learning Assistant**, *University of Texas at Austin*, Austin, TX, USA
- Assisted with the course *Matrices and Matrix Calculations* taught by Dr. John Gilbert in the Department of Mathematics

May 2015 - Aug 2015 **Software Technology Engineering Intern**, *Dell Inc.*, Austin, TX, USA
- Implemented a Windows 10 Universal App. to connect and share features between devices

Publications

Dec 2021 **Uniform Sampling over Episode Difficulty** [pdf]
Sèbastien M. R. Arnold*, **Guneet S. Dhillon***, Avinash Ravichandran, Stefano Soatto
* Equal contributions
- In Proceedings of **Conference on Neural Information Processing Systems (NeurIPS) 2021 (Spotlight)**

May 2020 **A Baseline for Few-Shot Image Classification** [pdf]
Guneet S. Dhillon, Pratik Chaudhari, Avinash Ravichandran, Stefano Soatto
- In Proceedings of **International Conference on Learning Representations (ICLR) 2020**
- Short version in Proceedings of Workshop on Meta-Learning, Conference on Neural Information Processing Systems (NeurIPS) 2019 (Spotlight)

May 2018 **Stochastic Activation Pruning for Robust Adversarial Defense** [pdf]
Guneet S. Dhillon, Kamyar Azizzadenesheli, Zachary C. Lipton, Jeremy Bernstein, Jean Kossaifi, Aran Khanna, Anima Anandkumar
- In Proceedings of **International Conference on Learning Representations (ICLR) 2018**
- Short version in Proceedings of Machine Deception Workshop, Conference on Neural Information Processing Systems (NeurIPS) 2017

Theses

May 2018 **Training Ising Models on Images using Sparsitron** [pdf]
Undergraduate Honors Thesis
Advisor : Dr. Adam Klivans
Co-Advisor : Dr. Philipp Krähenbühl

Patents

Nov 2020 **U.S. Patent 10,839,245: Structured Document Analyzer** [pdf]
Guneet S. Dhillon, Vijay Mahadevan, Yuting Zhang, Meng Wang, Gangadhar Payyavula, Viet C. Nguyen, Rahul Bhotika, Stefano Soatto

Research Projects

Jan 2016 - Dec 2017 **Clustering and Prediction in Time-Series Data**, with Dr. Sinead Williamson
Clustering time-series data and predicting future values by modeling the data using an infinite mixture of probabilistic auto-regressive models, learned using Gibbs sampling techniques

Nov 2017 - Dec 2017 **Generative Adversarial Networks (GANs) for Adversarial Training** [pdf], course project
Robust image classification using a generator-discriminator formulation to train deep networks

Nov 2016 - Dec 2016 **Conflict Graphs for Parallel Stochastic Gradient Descent** [pdf], course project
Training SVMs by exploring conflict graphs to parallelize stochastic gradient descent training

Jan 2015 - May 2015 **Genetic Algorithms for Efficient 3-D Printing**, Freshman Research Initiative project
Minimizing the overhang region in 3D printing using genetic algorithms to obtain optimal slicing planes

Apr 2015 - May 2015 **Efficient Thread Scheduling**, course project
Reducing the wait-time for threads by scheduling them based on past CPU and I/O times

Talks and Presentations

A Baseline for Few-Shot Image Classification

Jul 2021 Workshop on Computer Vision with Limited Labels, Amazon Computer Vision Conference (ACVC)
Dec 2019 Workshop on Meta-Learning, Conference on Neural Information Processing Systems (NeurIPS)
Jul 2019 Workshop on Computer Vision Services / Systems in Amazon, Amazon Machine Learning Conference (AMLC)
Jul 2019 Workshop on Data-Efficient Learning Techniques for Amazon Scale, Amazon Machine Learning Conference (AMLC)

Academic Services

Reviewer
- Conference on Neural Information Processing Systems (NeurIPS)
- International Conference on Machine Learning (ICML)
- International Conference on Learning Representations (ICLR)
- Amazon Machine Learning Conference (AMLC)

Honors and Awards

Oct 2021 - Current	Clarendon Fund Scholarship, Oxford *(only 1 awardee from the Department of Statistics)*
Aug 2017 - May 2018	Out-of-State Tuition Waiver, College of Natural Sciences, UT Austin *(only 5-7 awardees)*
Aug 2017 - May 2018	Thomas and Elizabeth Merner Scholarship in Natural Sciences, College of Natural Sciences, UT Austin
Aug 2017 - May 2018	Angus G. and Erna Pearson Endowed Undergraduate Scholarship, Department of Computer Science, UT Austin
Apr 2018	College Scholar, College of Natural Sciences, UT Austin
Aug 2016 - May 2017	Motorola Endowed Scholarship, Department of Computer Science, UT Austin
Apr 2017	College Scholar, College of Natural Sciences, UT Austin
Aug 2015 - May 2016	Angus G. and Erna Pearson Endowed Undergraduate Scholarship, Department of Computer Science, UT Austin
May 2015 - Aug 2015	TIDES FRI Summer Research Fellowship, College of Natural Sciences, UT Austin
Aug 2014 - May 2015	Freshman Scholarship, College of Natural Sciences, UT Austin *(awarded to only 5% freshmen)*
Aug 2014 - May 2015	Schein Memorial Scholarship, Department of Computer Science, UT Austin

Coursework

Audited Courses Caltech, 2018-20	Linear Algebra and Convexity *(Joel Tropp)*, Foundations of Machine Learning and Statistical Inference *(Anima Anandkumar)*, Foundations of Machine Learning *(Anima Anandkumar)*
Graduate Courses UT Austin, 2016-18	Convex Optimization *(Constantine Caramanis)*, Linear Models *(Peter Müller)*, Numerical Analysis: Linear Algebra *(George Biros)*
Undergraduate Courses UT Austin, 2014-18	Machine Learning / Vision: Honors *(Kristen Grauman)*, Artificial Intelligence: Honors *(Peter Stone)*, Honors Statistics: Honors *(James Scott)*, Geometric Foundations of Data Science *(Chandrajit Bajaj)*, Introduction to Data Mining *(Adam Klivans)*, Introduction to Stochastic Processes *(Stephen Walker)*, Introduction to Quantum Information Science *(Scott Aaronson)*, Randomized Algorithms *(David Zuckerman)*, Algorithms and Complexity: Honors *(Eric Price)*, Differential Equations with Linear Algebra: Honors *(Dan Knopf)*, Real Analysis I *(Hector Lomeli)*, Computational Intelligence in Game Research / Design I & II *(Cem Tutum)*, Introduction to Probability & Statistics *(Sinead Williamson)*, Matrices and Matrix Calculations *(John Gilbert)*, Financial Economics *(Svetlana Boyarchenko)*, Introductory Game Theory *(Dale Stahl)*, Microeconomic Theory *(Gerald Oettinger)*, Principles of Computer Systems: Honors *(Ahmed Gheith)*, Computer Organization & Architecture: Honors *(Ahmed Gheith)*, Discrete Math for Computer Science: Honors *(Isil Dillig)*, Data Structures: Honors *(Calvin Lin)*, Competitive Programming *(Etienne Vouga)*

Other Activities

Oct 2021 - Current	Member of the Clarendon Scholars' Association, Oxford
Aug 2014 - May 2018	Member of the Turing Scholars Student Association, UT Austin
Aug 2014 - May 2018	Member of the Sikh Student Association, UT Austin
Aug 2016 - May 2017	School Relations Director for the Undergraduate Machine Learning Labs, UT Austin
Oct 2016	Secured seventh position in the Electronic Trading Challenge, UT Austin
Jan 2015 - May 2016	Member of the Texas Table Tennis Team, UT Austin with an NCTTA Rank of 689
Feb 2016	Secured fourth position and an honorable mention in the dataHACK, UT Austin
Aug 2014 - Dec 2015	Member of the Longhorn Cricket Club Team, UT Austin